



## Changing Diesel Low Temperature Properties Using Additives

Diesel fuel is refined so that its low temperature properties are fit for the area and time it is to be used. However unseasonable cold snaps when the temperature drops below the cloud point of the fuel cause operating difficulties due to wax dropout.

The cloud point of a diesel fuel can normally only be lowered by the addition of a product with a lower wax content e.g. Heating Oil and similar products.

However by using additives called cold flow improvers it is possible to lower the temperature at which the wax crystals will block filters (the Cold Filter Plugging Point or CFPP) and the temperature at which the diesel freezes (Pour point). These additives work by changing the size and shape of the wax crystals.

Normally the cold filter plugging point is the same as or 1 to 2 °C below the cloud point while the pour point is 3 to 6 °C below the cloud point. With additives it may be possible to lower the Cold Filter Plugging Point by 1 to 2 °C and much more on the pour point.

Cold flow improvers can be an alternative to adding heating oil to improve the low temperature properties of diesel but **the following precautions must be observed.**

### EFFECTIVENESS

BP In-house testing has shown that these additives can have **only a minor effect** on the **cold filter plugging point** of diesel fuels made from the local Bass Strait crudes. But they will still lower the freezing point and stop problems caused by the diesel freezing solid in lines. Additives **will not change cloud point.**

The In-house testing has shown that they can lower the cold filter plugging point of diesel made from imported crude oil by up to 3 degrees even at half the recommended treat rate.

### MIXING

For a cold flow improver to work it must be mixed intimately with the fuel so there must be no undissolved wax present. It should be added to a tank before the fuel is put in so that mixing takes place. When adding a cold flow improver the fuel must be at least 5 to 10 °C above its cloud point. **It will not fix product in tanks that is showing signs of wax.** Pouring it in the top of a tank in which the wax has dropped out of the diesel is a waste of time.

### DETERGENCY

Commercially available cold flow improvers are often **combined with detergents** and other additives and sold as fuel conditioners. If such additives are used in bulk tanks the detergent in the **additive can strip rust and dirt from tanks** which may lead to reduced filter life for a short time until the tanks are clean.

## APPLICATION

The cold flow improver can be added to vehicle tanks to provide protection when vehicles are left overnight. It can also be added to bulk tanks but remember to **dewater the tank first to remove loose water and dirt.**

## SUPPLIERS OF COLD FLOW IMPROVER ADDITIVES

Additives that are claimed to improve cold flow properties are available from a number of Commercial Suppliers. A contact for one is supplied below to assist those who want to use an additive approach for resolving cold weather diesel problems.

Please note that BP does not endorse nor recommend any one particular supplier, customers should choose suppliers according with their own requirements.

Additive :- ROX DIESEL ANTIFREEZE FUEL ADDITIVE  
Supplied by :- National Petroleum Equipment  
Freecall 1800 028 283.

Treat rate – Recommended treat rate is 1 litre of additive in 500 litres of diesel but we have found that 1 litre in 1000 litres of diesel will lower the cold filter plugging point by 3 to 5 °C in BP manufactured diesel. It will also lower diesel pour point (freezing point) by more than 10 degrees, but **It will not change cloud point.**

**IMPORTANT NOTE** – This product also **contains a detergent additive** so precautions against dirt and water pickup should be taken **by dewatering tanks before dosing the product.**

In terms of its impact on cold flow properties it is equivalent to the addition of 25% Heating Oil except it will not lower the temperature at which wax crystals separate out, it will only modify the crystals to reduce the tendency to block filters.

## Application

Ideal where the problem is that fuel is freezing in lines, it will stop the freezing. Where the problem is wax crystals blocking filter, then its effectiveness may be limited by crude type. May not be so effective in Victoria and Tasmania due to the refineries using Gippsland crude oil.

**For further information, please call the BP Lubricants and Fuel  
Technical Helpline 1300 139 700 local call  
or visit [www.bp.com.au/fuelnews](http://www.bp.com.au/fuelnews)**